

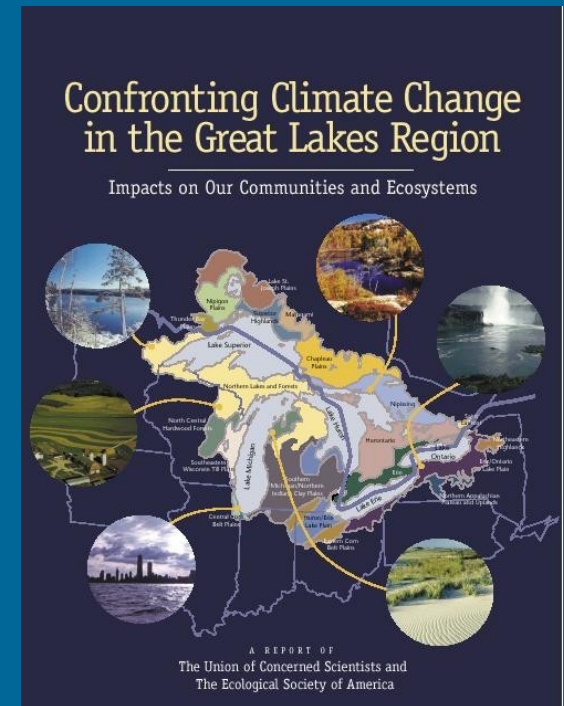
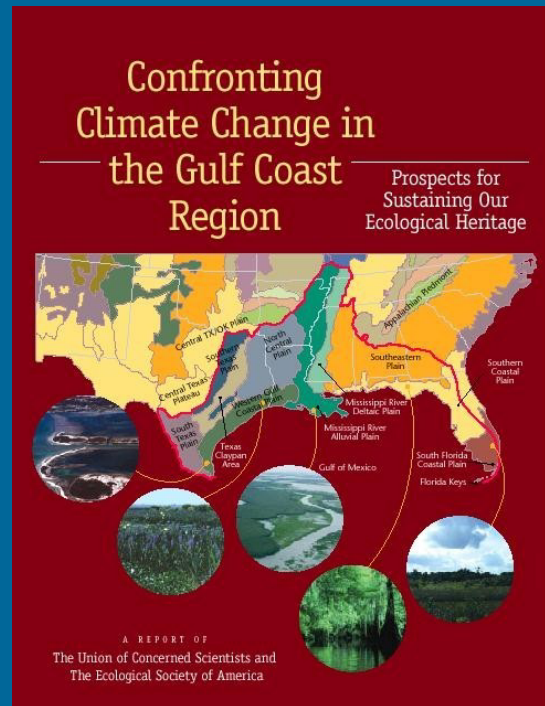
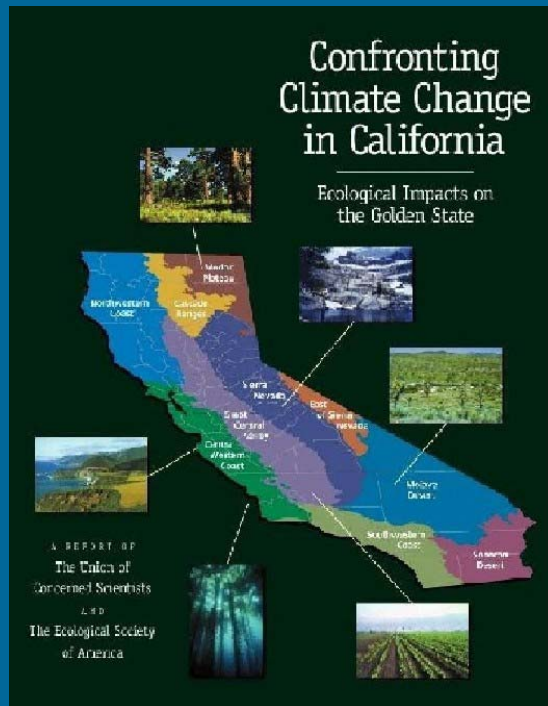
**Integrated Regional Climate Impacts
Assessments:
Lessons Learned and New Analyses for
California**

Peter C. Frumhoff, Union of Concerned Scientists

**CEC Climate Change Conference
Sacramento, CA**

8 June 2004

Regional climate impacts reports



199 → 2001 → 2003

Confronting Climate Change in the Great Lakes Region

Impacts on Our Communities and Ecosystems



A REPORT OF
The Union of Concerned Scientists and
The Ecological Society of America

George Kling (U Mich, lead)
Katharine Hayhoe (U IL)
Lucinda Johnson (U MN)
John Magnuson (U WI)
Steve Polasky (U MN)
Scott Robinson (U IL)
Brian Shuter (U of Toronto)
Michelle Wander (U IL)
Donald Wuebbles (U IL)
Donald Zak (U Mich)
Richard Lindroth (U WI)
Susanne Moser (UCS)
Mark Wilson (U MI)



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Source: Based
on data provided
by K. Hayhoe and
D. Wuebbles.



Source: Bob Allan,

Media Roll-Out

32 Wednesday, April 9, 2003

METRO

Chicago Sun-Times

Summer in the city could become more sweltering

Global warming may lower lake's water levels

5 or triple, study says

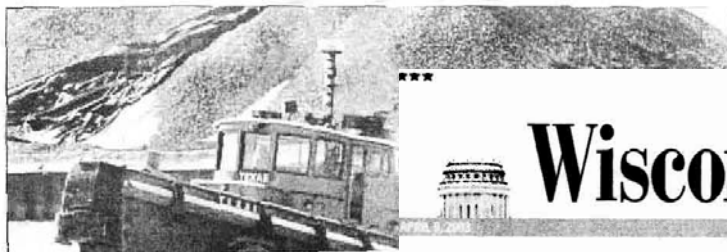
warning we've had since the Ice Age," Wuebbles said. "We are living through the largest experiment in the history of humanity. As temperatures continue to increase, we may see an increasing number of events like the flood of '93 and the drought of '88." The growing season may add 20 to 40 days, but with soil moisture falling 5 percent to 20 percent. Flooding will be up, but lake levels will be down.

But April's cold temperatures don't reflect the changes a new study reveals

University of Toronto and four Midwestern universities, including the University of Wisconsin, wrote the report.

The scientists did the study because "it's in our own backyard," said James Hodgson, a biology and environmental science professor at St. Norbert College who discussed the findings Tuesday.

Not only will Wisconsin's future generations see winter temperatures go up between 5



W E D N E S D A Y

Wisconsin State Journal

By Monique Balas
The News-Chronicle

Climate report predicts hot, hard times for Illinois

Warming in future may yield water, pest woes

By GREG KLINE
News-Gazette Staff Writer

us more to diseases such as West Nile virus and to more severe weather, and create many challenges for

"It's a mixed Donald Wuebbles expert and head of the University of Illinois at Urbana-Champaign's Department of Atmospheric Sciences

UI researchers Katharine Hayhoe, Scott Robinson and Michelle Wander also helped



Star Tribune

NEWSPAPER OF THE TWIN CITIES

www.startribune.com

Metro
Edition

Up North may feel more like the South

Study: Global warming to dramatically alter state

PIONEER PRESS

MINNESOTA'S FIRST NEWSPAPER

WEDNESDAY, APRIL 9, 2003

CITY EDITION 4.5

Minnesota expected to feel heat

Report predicts effects of global warming

BY DENNIS LIEN
Pioneer Press

ic organizations, the Union of Concerned Scientists and the Ecological Society of America.

Susanne Moser, a staff scientist for the Union of Concerned Scientists. But other scientists have challenged that method of measuring the impacts of

Minnesota may get hot as Kansas, report says

egi
st of

The future is hot and humid

Great Lakes study says everyone

has to cut back or we'll bake

The Hamilton Spectator

Friday, April 11, 2003

Page: A9

Great Lakes study calls for efforts to lower emissions

SOUTHFIELD, Mich. (AP) of such gases as heat-trapping

Outreach: Great Lakes



- Outreach in all states,
- State summaries -- impacts and solutions
- Focus on IL, MI, MN
- 665 regional scientists engaged in outreach and distribution
- 2600 hard copies distributed
- Web feature, downloads
- DC Hill briefings
- Several thousand emails sent to Great Lakes governors



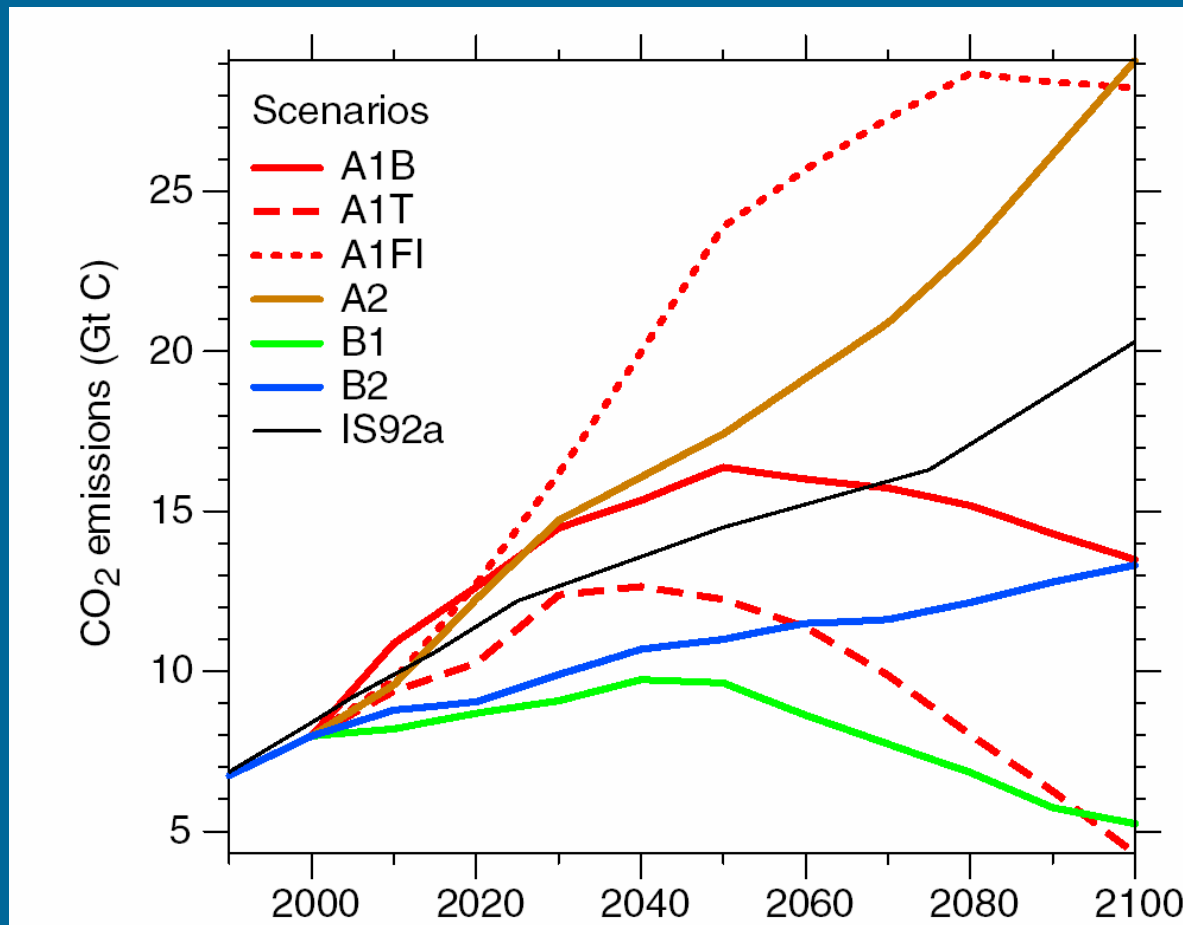
New Projections of Climate Change in California

- What are the consequences of following markedly divergent emissions pathways?
 - for temperature and precipitation
 - for impacts on key sectors
- Release initial findings – Sept 04
 - journal article
 - UCS-produced summaries for public and policymaker audiences

Collaborators

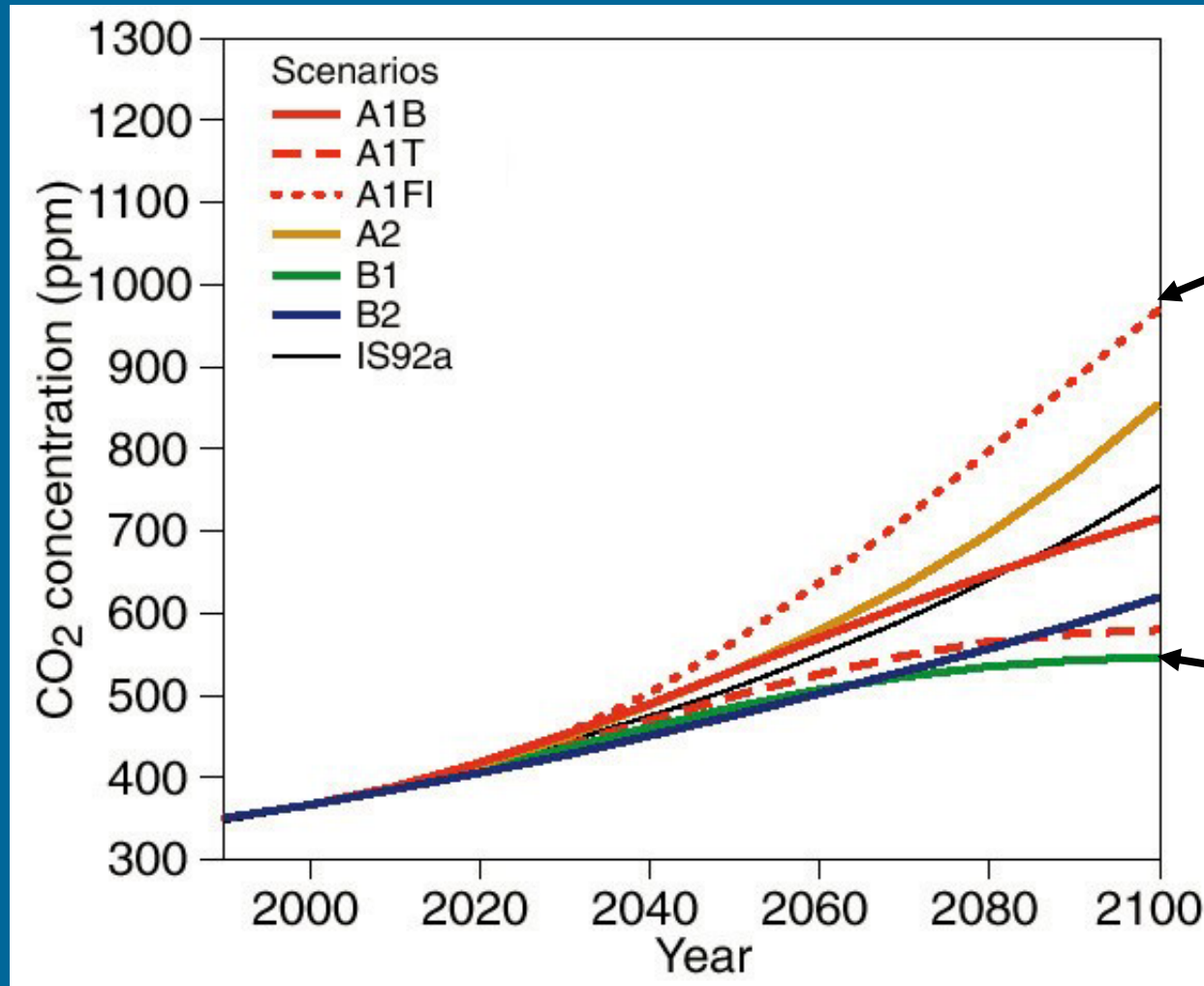
- Katharine Hayhoe, ATMOS Research & Consulting
- Dan Cayan, Scripps Institution of Oceanography
- Chris Field, Carnegie Institute
- Ed Maurer, Santa Clara University
- Norman Miller, Larry Dale, Lawrence Berkeley Labs
- Steve Schneider, Stanford
- Kim Cahill, Claire Lunch, Elsa Cleland, Stanford
- Michael Hanemann, UC Berkeley
- Ron Neilson, Jim Lenihan USDA Forest Service
- Susanne Moser, National Ctr for Atmospheric Research
- Frank Davis, UC Santa Barbara
- Larry Kalkstein, University of Delaware
- Scott Sheridan, Kent State University
- Julia Verville, Union of Concerned Scientists

IPCC Emissions Scenarios



SRES

CO₂ Concentrations

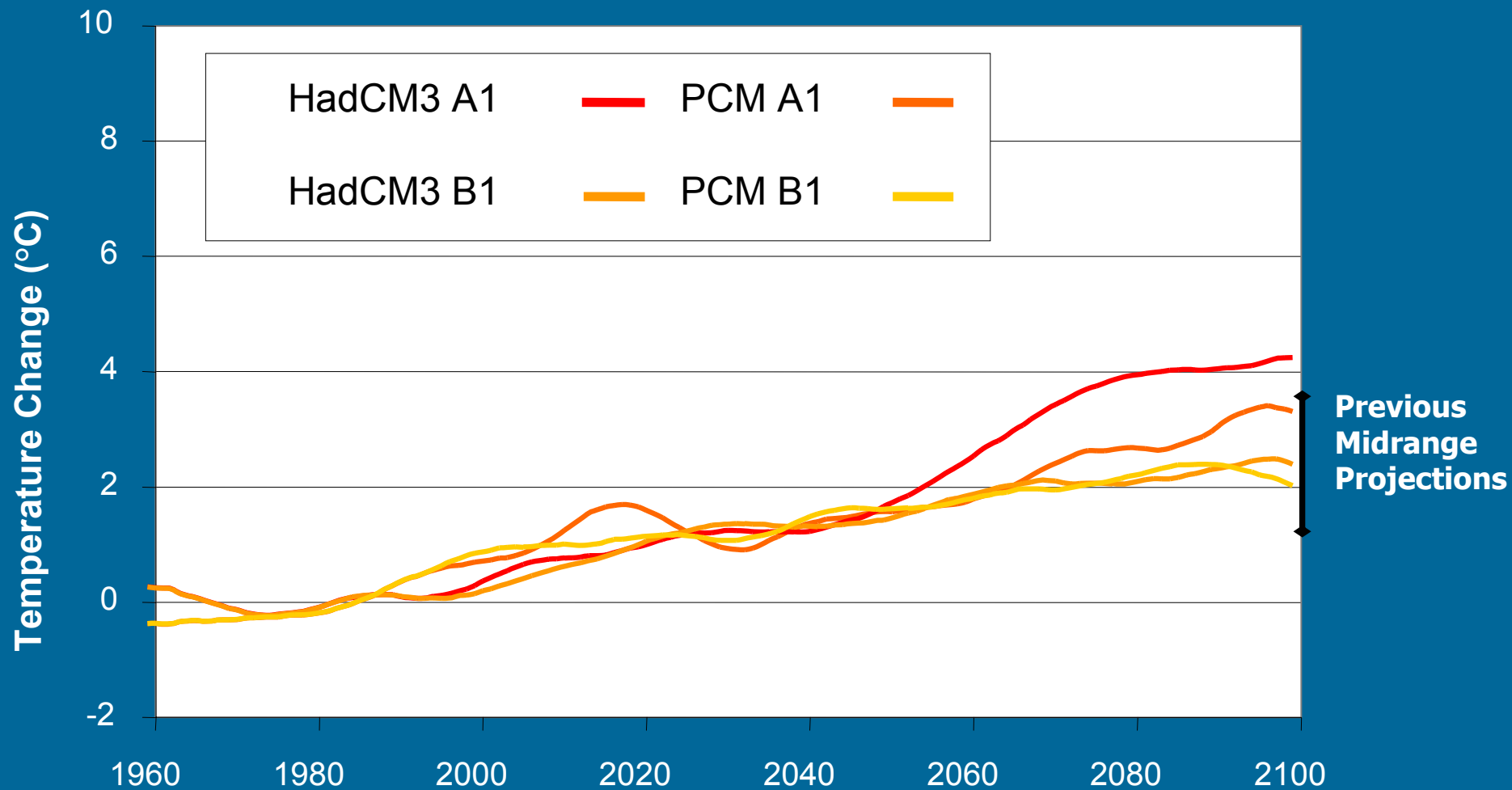


A1Fi

B1

California Temperature Projections Statewide Average

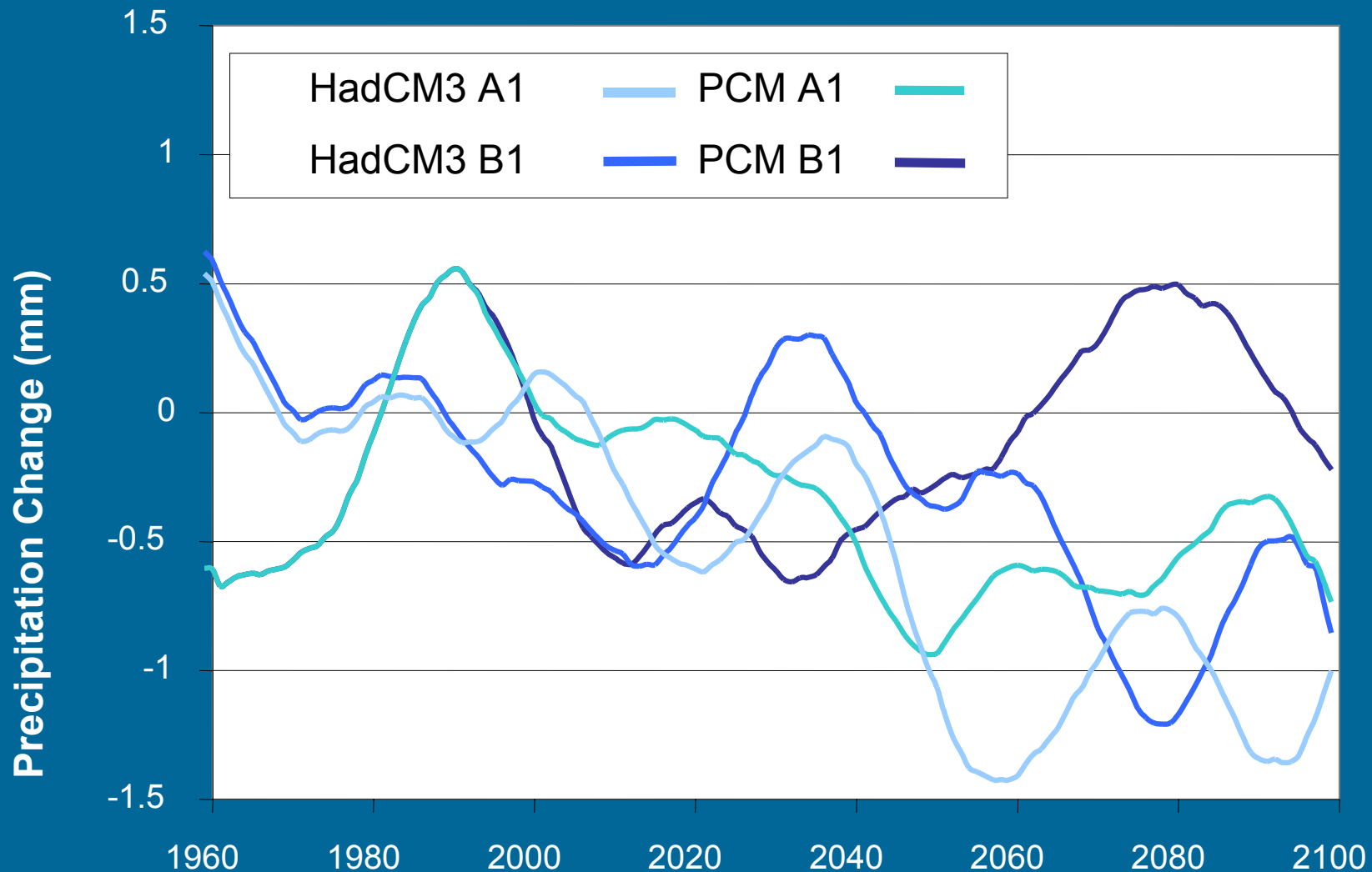
Winter (DJF)



California Precipitation Projections

Statewide Seasonal Average

Winter (DJF)

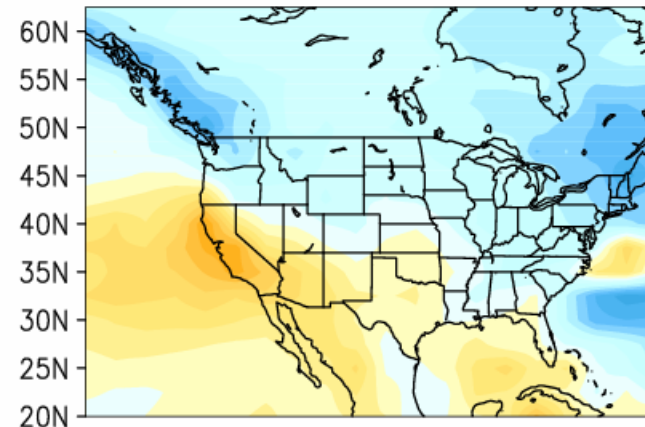
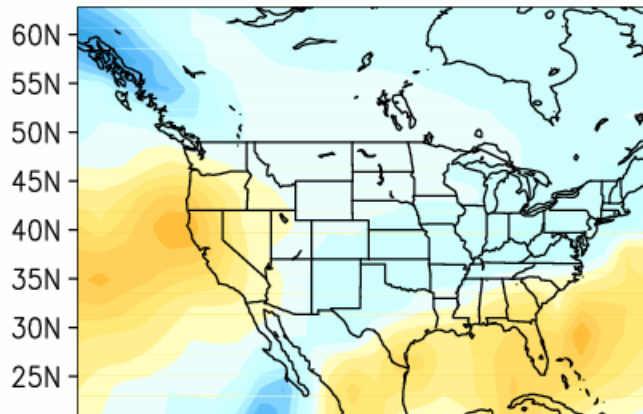


Winter Precipitation

Winter Precipitation Anomaly – (2070–2099)–(1961–1990)

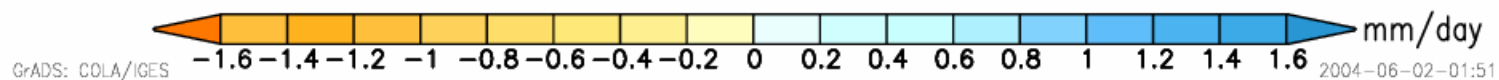
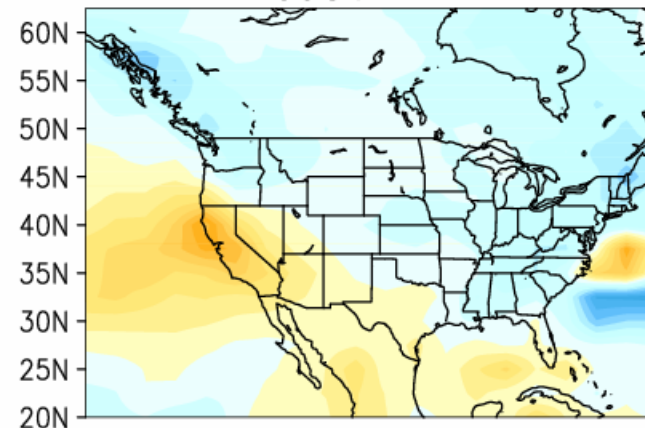
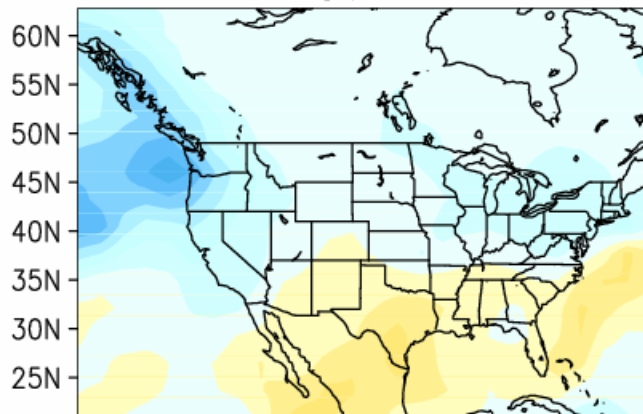
PCM A1fi

HadCM3 A1fi



PCM B1

HadCM3 B1





Implications for Key Climate-Sensitive Sectors

Extreme heat and heat-related mortality (5 CA cities)

Sierra snowpack and water supply

Agriculture (wine grapes, dairy)

Vegetation distribution

Fire risk

Project Overview

Describe Projected Climate Change for California under Range of Emissions Futures

**Update
Projected Impacts
On Key Sectors**

**Strategically Communicate
Findings
Summer 2004 – Winter 2005
Phase I**

**More Detailed
Assessments of
Projected Impacts on
Key Sectors**

**Strategically
Communicate Findings
2006-2007
Phase II**



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of the warming of the past 50 years – and continuing at least through this century – is likely attributable to emissions of heat-trapping (greenhouse) gases from human activities such as driving motor vehicles and producing electricity in power plants. Fortunately, scientifically sound, common-sense solutions are available to cut significantly reduce those emissions.

The face of threats from global warming and related climate changes to our water resources, agriculture, coastlines and beaches, air quality, and unique species and places, California has taken important steps to reduce heat-trapping emissions by:

- Promoting renewable energy and energy efficiency
- Encouraging the development of a new generation of less-polluting cars and trucks
- Passing legislation to reduce global warming emissions from motor vehicles
- Creating an inventory and registry of heat-trapping gas emissions

These actions demonstrate to the rest of the nation that strong global warming solutions are both practical and beneficial to our environment and our economy.

We applaud you, Governor Gray Davis, our State Legislators, and other leaders in California for promoting and adopting these and other measures, and we urge you to continue your leadership in achieving global warming solutions.

Sincerely,

undersigned group of California scientists

| | |
|---|--|
| Harold W. Kestner, Ph.D. California Air Resources Board | Eric M. Higgins, Ph.D. San Diego State University |
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| Joseph H. Klemm, Ph.D. University of California, Berkeley | Terry L. Root, Ph.D. Lawrence Livermore National Laboratory |
| Randall O. Knight, Ph.D. University of California, Berkeley | Dan Robinson, Ph.D. University of California, Berkeley |
| Flavio Kunkin, Ph.D. University of California, Berkeley | Hyman Rudolf, Ph.D. University of California, Berkeley |
| Erin A. Lawrence, Ph.D. San Francisco State University | Hugh D. Safford, Ph.D. USDA – Forest Service |
| Wanlan Liu, Ph.D. University of California, Berkeley | Benjamin D. Sarter, Ph.D. Lawrence Livermore National Laboratory |
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| Mark Moldwin, Ph.D. University of California, Los Angeles | Ellen Simms, Ph.D. University of California, Riverside |
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| Shao S. Prasad, Ph.D. University of California, Berkeley | |
| Michael J. Prather, Ph.D. University of California, Berkeley | |
| Robert Rhoads, Ph.D. University of California, Irvine | |

Organizational affiliations are for identification purposes only.
Full list of scientists available at www.ucusa.org

As scientists from across the state with expertise in many disciplines relevant to global environmental change, we, the undersigned, applaud you for your vision and courage in implementing solutions to global warming.

There is no longer any credible scientific debate about whether climate change exists. Most of the warming of the past 50 years – and continuing at least through this century – is likely attributable to emissions of heat-trapping (greenhouse) gases from human activities such as driving motor vehicles and producing electricity in power plants. Fortunately, scientifically sound, common-sense solutions are available that can significantly reduce those emissions.

In the face of threats from global warming and related climate changes to our waters resources, agriculture, coastlines and beaches, air quality, and unique species and habitats, California has taken important steps to reduce heat-trapping emissions by:

- ✔ Promoting renewable energy and energy efficiency
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Sincerely,

The undersigned group of California scientists

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Full list of scientists available at www.ucsusa.org



Union of Concerned Scientists
Sound Science, Practical Solutions • www.ucsusa.org



Regional Climate Impacts Reports Strategy and Approach

- Regional focus to “bring global climate change home”
- Use scientific and policy filters to choose regions
- Ask regional experts to carry out independent assessment of projected impacts
- Ensure that report is peer-reviewed, policy-relevant, accessible, attractive



Strategy and Approach: Outreach

- Provide authors with media and training
- Recruit additional regional scientists for outreach
- Carry out comprehensive media and outreach strategy



Lessons Learned

- State and issue fact-sheets critical.
- Make links between local impacts and solutions explicit, but don't ask scientists to be advocates or speak outside their expertise.
- Long-term regional commitment essential to leverage report findings for policy change.

Worst Impacts Are Not Inevitable

No-regrets solutions available now

A three-pronged approach to deal with climate change:

1. Reducing our emissions
2. Minimizing pressure on the environment
3. Planning and preparing to manage the impacts of a changing climate



Source: Claude Grondin